What is claimed is:

1. A method of determining a measurement uncertainty of a test system comprising:

developing a test system model having a plurality of uncertainty terms;

entering the test system model into a simulator;

running a sufficient number of iterations of the test system model on the simulator while randomly varying each of a first portion of the plurality of uncertainty terms within probability distributions to produce a statistically significant number of results of a selected parameter; and

evaluating the results to determine a measurement uncertainty of the selected parameter.

2. The method of claim 1 wherein the simulator uses a harmonic balance simulation engine to produce the results.

3. The method of claim 1 wherein the simulator uses a time-domain simulation engine to produce the results.

4. The method of claim 1 wherein the simulator uses a linear S-parameter simulation engine to produce the results.

5. The method of claim 1 wherein the plurality of uncertainty terms includes a noise term.

6. The method of claim 1 wherein the plurality of uncertainty terms includes a test instrument uncertainty term for a test instrument in the test system.

7. The method of claim 6 wherein the test instrument uncertainty term is selected from the group consisting of a temperature drift uncertainty term, an aging drift uncertainty term, an accuracy uncertainty term, and a repeatability uncertainty term.

8. The method of claim 1 wherein the test system model includes a device

under test and the step of running the sufficient number of iterations provides a first frequency to the device under test, and the results of the selected parameter are at a second frequency.

9. The method of claim 8 wherein the second frequency is a harmonic of the first frequency.

10. The method of claim 8 wherein the second frequency is a mixing product of the first frequency and a third frequency.

11. The method of claim 1 wherein the test system model includes a test instrument as a device under test.

12. The method of claim 1 wherein the test system model includes a test fixture comprising a plurality of switches and a plurality of cables.

13. The method of claim 1 wherein the step of running occurs at a first operating condition and further comprising steps of:

running a sufficient number of iterations of the test system model on the simulator at a second operating condition while randomly varying each of the first portion of the plurality of uncertainty terms within probability distributions to produce a statistically significant number of second results of the selected parameter; and

evaluating the second results to determine a second measurement uncertainty of the selected parameter.

14. The method of claim 1 wherein the step of running is done using a first type of simulation engine and further comprising steps of:

running a second sufficient number of iterations of the test system model on the simulator using a second type of simulation engine while randomly varying each of the first portion of the plurality of uncertainty terms within probability distributions to produce a statistically significant number of second results of a second selected parameter; and

evaluating the second results to determine a second measurement uncertainty of the

second selected parameter.

15. The method of claim 1 further comprising a step of developing a computer-readable library of test system components with uncertainty terms, and wherein the step of entering the test system model into the simulator includes loading uncertainty terms associated with the test system components from the computer-readable library.

16. The method of claim 1 wherein the step of developing the test system model includes automatically generating system specifications.